

### **REMARKS**

This paper responds to the Office Action mailed on March 29, 2006.

No claims are amended, no claims are canceled, and no claims are added; as a result, claims 1-8, 11-24 and 26 are now pending in this application.

### **Information Disclosure Statement**

Applicant submitted a Supplemental Information Disclosure Statement and a 1449 Form on June 2, 2004. Applicant respectfully requests that an initialed copy of the 1449 Form be returned to Applicant's Representatives to indicate that the cited reference has been considered by the Examiner.

### **§102 Rejection of the Claims**

Claims 1-3, 5-6, 11-21, 23-24 and 26 were rejected under 35 U.S.C. § 102(b) for anticipation by Doan et al. (U.S. 5,372,973). Applicant respectfully traverses this rejection.

The cited reference of Doan is seen as disclosing a method to form self aligned gate structures around cold cathode emitter tips using chemical mechanical polishing (CMP). The emitter tip may “optionally, be coated with a low work function material” (See col. 6, lines 34-35) by “sputtering”. As may be seen by figures 6A and 6B the tip of the emitter 13 may be coated by sputtering, but the only material shown coating the emitter 13 is the nitride layer 18.

Applicant respectfully submits that the cited reference fails to disclose the feature of “...emitter comprising silicon having a coating embedded in substantially the entirety of the surface of the at least one emitter that releases electrons at a predetermined energy level, the coating acts in the presence of outgassing to inhibit degradation of the at least one emitter...”, as recited in claim 1, from which claims 2-3 and 5-6 depend either directly or indirectly. The cited reference does not suggest that the entire emitter is coated, only the tips, and the described method could only coat the tip of emitter 13 through the narrow opening in the conductive layer 15. Applicant respectfully submits that the present application has a material that is embedded in

the emitter and covers substantially the entire emitter, as shown in figure 3 (layer 306 extending over the entire emitter 301), and as further shown in figure 4 with layer 418 extending over the entire emitter 401. That this is so is not surprising since the cited reference only discloses the use of the coating for increased emitter efficiency, which only occurs at the sharp location at the very tip, and thus would have no possible reason to want to coat the entire emitter 13. By contrast the present invention has the *coating acts in the presence of outgassing to inhibit degradation of the at least one emitter* and thus would prefer to have the entire emitter coated.

Applicant respectfully submits that the cited reference fails to disclose the feature of “...*at least one emitter comprising silicon having a coating embedded in substantially the entirety of the surface of the at least one emitter that releases electrons at a predetermined energy level, the coating decomposes at least one matter in the presence of outgassing to inhibit degradation of the at least one emitter, wherein the outgassing includes organic matters...*”, as recited in claim 11. This is true for similar reasons to those given above, and since the remaining independent claims recite similar features, the independent claims are held to be patentably distinct over the cited reference, since there is no disclosure of an embedded coating over substantially the entire emitter.

The dependent claims are held to be in patentable condition at least as depending from base claims shown above to be patentably distinct over the cited reference. In view of the above noted failures of the cited reference to disclose recited features of the present claims, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claims 1, 4 and 6 were rejected under 35 U.S.C. § 102(b) for anticipation by Koga et al. (U.S. 5,925,891). Applicant respectfully traverses this rejection.

The cited Koga reference has been discussed in the previous response, and discloses a withdrawn electrode 19A with a circumferential diameter smaller than the openings in the first and second insulator films 16A and 18A (figure 1 and col. 10 lines 23-42). The coating 20 is formed by sputtering and coats the cathode 17, the bottom of the well on the substrate 11, and the top of the withdrawn electrode 19A. This is not an embedded coating and is formed on the surface of the cathode, substrate and electrode. The coating 20 or 22 or 23 are not patterned or etched, but rely upon the overhang of the withdrawn electrode 19A over the insulator layers 16A

and 18A to ensure no continuity of the layer 20. If layer 20 was continuous, it would result in a short circuit to the adjacent cathodes 17, and thus a non functional device. The Examiner's statement on page 3 of the outstanding Office Action that the formation of the emitter inherently results in a roughened surface with micropores, is not clear, is nowhere suggested in the cited reference, and is clearly taught against by the description, in particular figures 18(a) and 18(b).

Applicant respectfully submits that the cited reference fails to disclose the feature of *"...emitter comprising silicon having a coating embedded in substantially the entirety of the surface of the at least one emitter that releases electrons at a predetermined energy level, the coating acts in the presence of outgassing to inhibit degradation of the at least one emitter..."*, as recited in claim 1. The Examiner admits on page 4 that Koga does not disclose the coating acting in the presence of contamination to prevent damage, and the intentional discontinuity of the film, as noted above would result in a defective device if the suggested combination were made.

The dependent claims are held to be in patentable condition at least as depending from a base claim shown above to be patentable over the cited reference. In view of the above noted failures of the cited reference to disclose recited features of the present claims, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

#### §103 Rejection of the Claims

Claims 4 and 7-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Doan et al. (U.S. 5,372,973) as applied to claim 1 above, and further in view of Takemura (U.S. 5,666,020). Applicant respectfully traverses this rejection.

The cited reference of Doan has been discussed above. Takemura discloses an emitter with a top portion (20a) having the highest resistance (col. 4, lines 45-48 and col. 5, lines 13-16). There may be a coating of platinum silicide, titanium silicide, tungsten silicide, or molybdenum silicide at the top of the emitter 20 (see col. 5, lines 22-25), and that the emitter has a resistance that increases toward the top of the emitter (col. 5, lines 3-5). Applicant respectfully submits that Takemura discloses that the portion of the emitter closest to the tip is coated with a third material (col. 5, lines 22-23).

Applicant respectfully submits that the suggested combination of references fails to describe or suggest “... *emitter comprising silicon having a coating embedded in substantially the entirety of the surface of the at least one emitter that releases electrons at a predetermined energy level, the coating acts in the presence of outgassing to inhibit degradation of the at least one emitter...*”, as recited in claim 1, from which claim 4 depends. The addition of Takemura does nothing to cure the above noted failure of Doan to suggest an embedded coating over the entire emitter. Similar reasoning applies to claim 7, from which claim 8 depends.

In view of the above, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claim 22 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Doan et al. as applied to claim 18 above, and further in view of Hush (U.S. 5,663,742). Applicant respectfully traverses this rejection.

The cited reference of Doan has been discussed above. The cited reference of Hush is used in the outstanding Office Action to show that field emitter devices used as camcorder viewfinder is known. Applicant respectfully submits that the cited Hush reference does nothing to correct the above noted failure of the cited Doan reference to describe or suggest at least the claimed combination of features of “...*at least one emitter having a coating embedded in substantially the entirety of the surface of the at least one emitter that releases electrons at a predetermined energy level, the coating is stable in the presence of the outgassing ...*”, as recited in claim 18 from which claim 22 directly depends. Whether or not the suggested combination of references is proper, the result of the combination still does not contain each and every feature of the claim in question.

In view of the above discussion, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney David Suhl at (508) 865-8211, or the undersigned attorney at (612) 371-2157 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

BEHNAM MORADI ET AL.

By their Representatives,

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Date 30 May 2006

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**CERTIFICATE UNDER 37 CFR 1.8:** The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 30 day of April, 2006.

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